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ABSTRACT

To determine the feasibility of establishing a program for training cardiac exercise technicians and leaders at William Rainey Harper College, a survey instrument was mailed to 901 organizations who were potential employers. No follow-up was used and 85 questionnaires were returned (9.4%). It was assumed that none of the non-respondents were interested in the proposed programs and that none would hire any of Harper's graduates. Results were divided and tallied by local, regional, and out-of-state regions. It was demonstrated that the demand for graduates and for specialized training for current employees seemed to be adequate to support both the technician and leader programs. A local Chicago area marketing approach could support an enrollment of 16 full-time-equivalents each semester for each program. If the programs were expanded to serve the entire midwestern United States area, enrollment would double. This would, however, require the use of concentrated instructional modules, and the enrollment of students willing to leave Chicago for employment. The survey showed many internship opportunities, and starting salaries adequate to attract students. A detailed analysis of questionnaire items is given. The survey instrument and sample curricula for the two programs are appended. (Author/RT)

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SURVEY OF NEED FOR AN EDUCATIONAL PROGRAM FOR CARDIAC EXERCISE TECHNICIANS AND LEADERS

Vol. VIII, No. 12
April 22, 1977

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JC 770 492

ABSTRACT

THE PURPOSE OF THIS STUDY WAS TO DETERMINE THE FEASIBILITY OF ESTABLISHING PROGRAMS FOR CARDIAC EXERCISE TECHNICIANS AND LEADERS AND TO GATHER OTHER DEMOGRAPHIC AND EVALUATIVE INFORMATION AS REQUIRED. A SURVEY INSTRUMENT WAS MAILED TO 901 ORGANIZATIONS REPRESENTING CLINICS, HOSPITALS, YMCA'S, ATHLETIC ASSOCIATIONS, PHYSICAL FITNESS CLUBS AND COLLEGES AND UNIVERSITIES IN ILLINOIS AND EIGHT OTHER NEARBY STATES. NO FOLLOW-UP WAS USED AND 85 SURVEY INSTRUMENTS WERE RETURNED FOR A 9.4 PERCENT RESPONSE RATE. THE RESULTS WERE DIVIDED AND TALLIED BY THREE DIFFERENT GEOGRAPHIC AREAS, LOCAL, REGIONAL AND OUT-OF-STATE.

RESULTS OF THE STUDY DEMONSTRATED THAT THE DEMAND FOR GRADUATES OF HARPER'S PROPOSED PROGRAMS AND THE DEMAND FOR SPECIALIZED EDUCATION FOR CURRENT EMPLOYEES ON THE JOB SEEM TO BE ADEQUATE TO SUPPORT THESE CARDIAC EXERCISE TECHNICIAN AND LEADER PROGRAMS. A LOCAL CHICAGO AREA MARKETING APPROACH COULD SUPPORT AN ENROLLMENT OF 16 FTE EACH SEMESTER FOR EACH OF THESE TWO PROGRAMS. IF THE PROGRAM WERE EXPANDED TO SERVE THE WHOLE MIDWESTERN UNITED STATES AREA, THE ENROLLMENT COULD BE DOUBLED. HOWEVER, STUDENTS WOULD HAVE TO BE RECRUITED WHO WOULD BE WILLING TO LEAVE THE CHICAGO AREA FOR EMPLOYMENT. IN ADDITION, THE FORMAT OF COURSES MIGHT HAVE TO BE ADJUSTED TO CONCENTRATED MODULES TO APPEAL TO OUT-OF-STATE STUDENTS ALREADY EMPLOYED IN THE FIELD.

THERE IS ABUNDANCE OF INTERNSHIP OPPORTUNITIES FOR STUDENTS IN THE PROGRAM AND THE STARTING SALARY QUOTES SEEMS ADEQUATE TO ATTRACT STUDENTS INTO THE PROGRAM. FLEXIBILITY MAY BE DEMANDED IN THE CURRICULUM TO ALLOW STUDENTS TO SPECIALIZE OR TO GENERALIZE, TO CONCENTRATE TOWARD A CLINICAL HEALTH BACKGROUND, OR TO CONCENTRATE IN THE RECREATIONAL AREA, DEPENDING ON THE JOB REQUIREMENTS.

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Purpose

The Vice-President of Academic Affairs requested that a study be conducted to determine the feasibility of developing programs for Cardiac Exercise Technicians and Leaders. The purpose of the study was primarily to determine how large the program could be and still place all the graduates in jobs in the field. In addition, expected salary, opportunity for internships, background of present employees and reactions to Harper's proposed curriculum were gathered.

Method

The Director of Environmental Health, with help from an Advisory Committee, designed the survey instrument shown in the appendix. The Director of Environmental Health then mailed the survey with a return envelope to each organization in the target population. No attempt was made to follow-up non-responders. The mail survey responses were then tallied and interpreted by the Office of Planning and Research.

Population Surveyed

The Director of Environmental Health was able to obtain a mailing list of 700 names from the American College of Sports Medicine representing organizations from Illinois and eight nearby states. Then adding to this a list of all YMCA's in Illinois, recreation districts in the Chicago area, and suggestions from the Advisory Committee and suppliers, the total target population was increased to a total of 901 organizations. Completed surveys were received by mail from 85 organizations for a 9.4 percent response rate.

The respondents represented Clinics and Hospitals (32%), YMCA's (22%), Athletic Associations (14%), Physical Fitness Clubs (14%), Colleges and Universities (16%), an industrial firm and a baseball club. The survey returns were divided and tallied by three geographic areas. There were 28 returns from the Chicago area, 10 returns from Illinois outside the Chicago area and 47 returns from out-of-state (in the eight states near to Illinois).

The assumption was made that none of the non-respondents were interested in the proposed programs and that they would not hire any of Harper's graduates. The projections on the size of the program which could be supported were conservative, based on the firm commitments of those who did respond to the survey.

Discussion of Results

The following two tables show the demand for both the Cardiac Exercise Technician and the Leader Programs, the demand for the Chicago area and the demand for the total midwestern United States area.

Demand for Cardiac Exercise Techicians

	Local		Total	
	Number reported needed	Projected* number of enrollees per semester	Number reported needed	Projected* number of enrollees per semester
New graduates hired	23	9.2 F-T	37	14.8 F-T
Employees sent back for degree	6	2.4 F-T	15.5	6.2 F-T
Employees sent back for certificate	14	2.8 F-T	43	8.6 F-T
Employees sent back for professional growth	40.5	4.1 H-T	88.5	8.9 H-T
Total heads		19		39
Total FTE		16		33

*Projection assumes demand will turn around every five years

Demand for Cardiac Exercise Leaders

	Local		Total	
	Number reported needed	Projected* number of enrollees per semester	Number reported needed	Projected* number of enrollees per semester
New graduates hired	24	9.6 F-T	32	12.8 F-T
Employees sent back for degree	5	2.0 F-T	8.5	3.4 F-T
Employees sent back for certificate	13.5	2.7 F-T	31	6.2 F-T
Employees sent back for professional growth	35.5	3.6 H-F	59.5	6.0 H-T
Total heads		18		28
Total FTE		16		25

*Projection assumes demand will turn around every five years

These tables indicate the Technician Program could support 16 FTE per semester if Harper wanted to consider only serving local organizations and local placement. The program could be expanded to 33 FTE per semester if Harper were to consider

serving the whole mid-west and placing its graduates accordingly. Similarly, the Leader Program could support 16 FTE per semester serving a local market and 25 FTE with a mid-west market. While expanding the market from the local Chicago area to mid-western United States could double the enrollment, it might require changing the format. For example, courses might have to be offered in concentrated modules in order to attract out-of-state employees.

The annual salaries which organizations say they would pay potential Harper graduates, average between $9,200 and $11,400 for both the Technicians and Leaders.

This salary is about the same as being reported by current Vo-Tech graduates at Harper. Therefore, the salary seems to be adequate to attract students into the field.

Some 21 local organizations and 46 total organizations said they definitely would provide internships for Harper students in the proposed Cardiac Exercise Technician program. Since only seven or eight students would require the internship program per year, there would be a wide selection of potential internship opportunities. Similarly, 16 local organizations and 36 total organizations said they definitely would provide internships for Harper students in the proposed Cardiac Exercise Leader program. Again there will be a wide variety of internships to choose from as only six to seven students per year would need an internship.

About 62 percent of the organizations surveyed use Exercise Technicians while 51 percent used Exercise Leaders. In terms of educational background, 64 percent of the technicians and 70 percent of the leaders have bachelors degree or higher.

The major functions expected of technician graduates as agreed to by 95 percent of the organizations are: calculating exercise data, interaction with professionals and patients, administration of graded exercise test and the preparation of the station. Only about 63 percent of the sampled organizations thought implementing emergency procedures was a major function. In addition, some organizations thought supervising exercise programs, prescribing exercises and making educational presentations were also major functions.

The major function expected of leader graduates as indicated by 95 percent of the respondents are: executing exercising prescriptions, working closely with technicians, interacting with other professionals and patient, educating patient and evaluating patient's response. About 84 percent of the organizations felt interpreting

metabolic data was a major function.

The comments concerning the curriculum varied widely based on the type of organization, the education background of present employees and the management orientation of the organizations sampled. Some institutions said they were looking for technicians and leaders with educational background beyond the two year degree and this is reflected in the high percentage of present employees with a bachelors degree or higher. At the other extreme, some organizations need a generalist where one person can function both as a technician and a leader. Some organizations feel there should be more stress in the clinical and health care area while other organizations feel more emphasis should be placed on recreation.

Major Conclusion

The demand for graduates of Harper's proposed programs and the demand for specialized education for current employees on the job seems to be adequate to support these Cardiac Exercise Technician and Leader programs. A local Chicago area marketing approach could support an enrollment of 16 FTE each semester for each of these two programs. If the program were expanded to serve the whole mid-western United States area, the enrollment could be doubled. However, students would have to be recruited who would be willing to leave the Chicago area for employment. In addition, the format of courses might have to be adjusted to concentrated modules to appeal to out-of-state students already employed in the field.

There is an abundance of internship opportunities for students in the program and the starting salary quotes seems adequate to attract students into the program. Flexibility may be demanded in the curriculum to allow students to specialize or to generalize, to concentrate toward a clinical health background, or to concentrate in the recreational area, depending on the job requirements.

DETAILED RESULTS

FROFILE OF ORGANIZATIONS RESPONDING

Description of Organizations Surveyed
in Terms of Type of Facility and Services Offered

Facility or Service	Chicago Area		Illinois Outside Chicago Area		Out-of State		Total	
	N	%	N	%	N	%	N	%
Exercise Program	16	57.1	6	60	29	61.7	52	61.2
Stress Testing for Evaluation	14	50.0	4	40	25	53.2	45	52.9
Exercise Prescription	14	50.0	5	50	23	48.9	44	51.8
Exercise Center	9	32.1	5	50	13	27.7	27	31.8
Clinical-hospital-private clinic	6	21.4	2	20	19	40.4	27	31.8
YMCA	11	39.3	5	50	3	6.4	19	22.4
Community Organizations	6	21.4	4	40	5	10.6	15	17.7
Sports Medicine	2	7.1	2	20	9	19.2	14	16.5
Physical Fitness Club	6	21.4	4	40	2	4.3	12	14.1
Basic Research Center	0	0	3	30	5	10.6	9	10.6
Athletic Associations	4	14.3	0	0	4	8.5	8	9.4
Cardiac Rehabilitation	2	7.1	0	0	3	6.4	5	5.9
Special Recreation Assoc. for the Handicapped	4	14.3	0	0	0	0	4	4.7
Educational Program	1	3.6	0	0	2	4.3	3	3.5
Clinical Evaluation and Pulmonary Impairment for Diagnosis	1	3.6	0	0	1	2.1	2	2.4
Nutritional Counseling	0	0	0	0	1	2.1	1	1.2
Smoking Withdrawal clinics	0	0	0	0	1	2.1	1	1.2
Stress Management	0	0	0	0	1	2.1	1	1.2
Professional Trainer	0	0	0	0	1	2.1	1	1.2
Evaluation of long-range propensity toward heart disease	0	0	0	0	1	2.1	1	1.2
Kinesiotherapy Clinic	0	0	0	0	1	2.1	1	1.2
Design exercise programs for groups	1	3.6	0	0	0	0	1	1.2
Industrial Health Service Department	0	0	0	0	1	2.1	1	1.2

SURVEY OF NEED FOR CARDIAC EXERCISE TECHNICIAN PROGRAM

Survey of Need for Cardiac Exercise Technician Program

Major function of a person completing proposed Cardiac Exercise Technician Program	Number and percent agreeing that this is a major function							
	Local Chicago Area		Illinois Outside Chicago Area		Out-of state		Total	
	N	%	N	%	N	%	N	%
Calculate data obtained during graded exercise	27	96.4	9	90	45	95.7	81	95.3
Interact and communicate with the program director, physician, exercise leader, subjects and patients	28	100.0	9	100	43	91.5	80	95.2
Administer graded exercise test	28	100.0	9	90	43	91.5	80	94.1
Prepare a graded exercise station for administration of tests	25	89.3	10	100	44	95.7	79	94.1
Implement emergency procedures	26	92.9	10	100	39	86.7	75	90.4
Screen patients for graded exercise test	22	78.6	6	66.7	24	52.2	52	62.7

Additional duties which person must be able to perform

	Number
Help supervise those who are exercising	5
Prescribe and design exercise programs for individuals	5
Teach or guest lecture in physical education or nursing classes	3
Patient education and motivation to maintain schedule discipline	3
Aid in evaluating patient's response and in interpreting data	3
Assist with cardiac rehabilitation and instruction	2
In a research laboratory must be able to perform diverse duties such as personnel supervision, chemical analysis, pulmonary function testing	2
Equipment calibration and maintenance	2
Administrative tasks and record keeping	2
Ability to publicize program	2
Possess reasonable knowledge in exercise physiology	1
Preparation of subjects for stress testing by placing ECG electrodes	1
Knowledge of pharmacology	1
Be able to modify testing for children and aging people	1
Procure equipment and/or supply items	1
Graded exercise testing should include ability to set up and screen EKG	1
Other duties in the lab relating to physiology testing	1
Physical measurements (skinfolds) and standard pulmonary function (test vital capacity)	1
Computer experience for processing data and records	1

If Cardiac Exercise Tech program were implemented, the number of graduates various organizations would hire

Year	Local Chicago Area	Regional out side Chicago in Illinois	Out-of-State	Total
1982	23	2	12	37
1983	20	0	10	30
1984	16	0	11.5	27.5

Annual Salary Range
Cardiac Exercise Technician Graduates Could Expect

Local Chicago Area	Regional in Illinois outside Chicago Area	Out-of-State	Total
$ 7,000-$ 8,000	$ 7,200-$ 9,000	$ 6,000- $ 8,000	
7,000- 9,500	9,000- 11,000	6,240- 10,400	
7,000- 10,000	10,000- 11,000	7,000- 10,000	
7,600- 9,600	10,000- 12,000	7,200- 7,500	
8,000- 10,000	10,000- 15,000	7,280- 7,280	
8,000- 10,000	12,000- 12,000	8,000- 9,000	
8,000- 10,000		8,000- 10,000	
8,000- 12,000		8,000- 10,000	
9,000- 10,000		8,000- 10,000	
9,000- 10,000		8,500- 10,500	
9,000- 10,300		8,800- 8,800	
9,000- 11,000		9,000- 10,000	
9,000- 11,000		9,000- 11,000	
9,000- 12,000		9,000- 11,000	
9,000- 12,000		10,000- 12,000	
9,000- 13,000		10,000- 12,000	
10,000- 11,000		10,000- 12,000	
10,000- 13,000		10,000- 13,000	
10,400- 10,400		15,000- 18,000	
11,000- 14,000		20,800- 31,200	
12,000- 15,000			
13,520- 16,640			
Average $9,069-$11,293	$ 9,700-$11,667	$ 9,291-$ 11,584	$ 9,240- $11,461
Median $9,000-$11,000	$10,000-$11,500	8,500-$ 10,000	$ 9,000- $11,000

Organizations Who Now Have Employees Working in the Role of Cardiac Exercise Technician

	Local Chicago area	Regional in Illinois outside Chicago area	Out-of-state	Total
Number of organizations	15	7	31	53
Percent of organization in sample	53.6	70	66.0	62.4
Number of organizations who have employees in this role with the following background				
Ph.D.	0	1	8	9
Ed.D.	0	0	1	1
M.S.	6	1	5	12
Degree plus cardiac technician training	1	0	0	1
M.Ed.	0	0	2	2
M.P.M.	0	0	1	1
M.A.	1	0	3	4
Cardiologist	0	0	1	1
Physical therapist	1	0	1	2
B.S.	6	2	6	14
B.A.	0	0	1	1
Degree not specified	2	2	1	5
R.N.	1	0	2	3
Certificate not specified	1	0	5	6
X-ray technician	0	0	1	1
ATC	0	0	1	1
CPR	0	0	2	2
ACSM	0	1	3	4
LPN	0	0	1	1
CET	1	0	1	2
Medical assistant	0	0	1	1
Student assistant	0	0	1	1
Fitness specialist	2	1	0	3
Sports medicine technician	1	0	0	1
Cardiac exercise technician	2	1	0	3
Special training	0	1	0	1
High School graduate	0	0	4	4

Number of Existing Employees
Who Would be Encouraged to Enroll in the Cardiac Exercise Technician Program

Type of enrollment	Local Chicago area	Regional in Illinois outside Chicago area	Out-of-town	Total
Only take courses for professional growth	40.5	6	42	88.5
Certificate in program	14	1.5	27.5	43
Degree in program	6	2	7.5	15.5

Number of Organizations Who Would be Interested
in Providing Internships for Students

Degree of Interest				
Definite	21	6	19	46
Possible or conditional	2	1	14	17

Local

Definitely Interested in Providing an Internship for Cardiac Exercise Technicians

1. Round Lake area park district
2. Ravenswood YMCA, Chicago
3. Northern Suburban Special Recreational Association, Highland Park
4. Lawson YMCA, Chicago
5. Lake Region YMCA, Crystal Lake
6. St. Francis Hospital, Blue Island
7. Fitness Analysis, Chicago
8. Metro Chicago, YMCA
9. North West Special Recreational Association, Arlington Heights
10. Northwestern Medical School, Evanston
11. Swedish Covenant Hospital, Chicago
12. Center for Sports Medicine, Northwestern U.
13. Condell Memorial Hospital, Libertyville
14. Learning Tower YMCA, Niles
15. Center for Sports Medicine, Illinois Masonic Hospital, Chicago
16. North Suburban YMCA, Des Plaines
17. Exercise Lab, Children's Memorial Hospital, Chicago
18. Evanston YMCA
19. Executive Heart Line, Niles
20. Buehler YMCA, Palatine
21. Northern Illinois Special Recreation Assoc., Crystal Lake

Local

Possibly Interested or Wo ld be Interested Under Some Conditions in Providing an Internship for Cardiac Exercise Technicians

1. Special Recreation Association, Oak Park, IL
2. Hyde Park YMCA, Chicago

Regional Interest in Providing Internships for Cardiac Exercise Technicians

Possibly interested or Interested in Providing Internship Under Some Conditions

1. YMCA in Peoria, IL

Definitely Interested

1. YMCA in Macomb, IL
2. Research Lab at Illinois State at Normal
3. V. A. Hospital, Marion, IL
4. Rock Island Family YMCA
5. Public Hospital in Kewanee, IL
6. Rockford YMCA

Out-of-State Possibly Interested or Would Be Interested Under Some Conditions in Providing an Internship for Cardiac Exercise Technicians

1. Human Performance Lab , Cleveland State University
2. Kimberly Clark Corporation, Newnaw, Wisconsin
3. Dept. of Physial Education, University of Toledo
4. V. A. Hospital, Wood, Wisconsin
5. Columbia Hospital, Milwaukee, Wisconsin
6. Skemp Grandview Clinic, LaCrosse, Wisconsin
7. Case Western Reserve U., Cleveland
8. Bellin Memorial Hospital, Green Bay, Wisconsin
9. Human performance lab, Ball State
10. University of Missouri, St. Louis
11. S. W. Michigan Cardiac Rehabilitation Center, Borgess Hospital, Kalamazoo, Michigan
12. Valparaiso U., Valparaiso, Indiana
13. Lafayette Area YMCA
14. Exercise Physical Fitness Lab, St. Cloud State U., St. Cloud, Minnesota

Out-of-State Definitely Interested in Providing
an Internship for Cardiac Exercise Technicans

1. Department of Physical Education, University of Wisconsin, Eau Claire
2. Cardiac Rehabilitation Program, University of Wisconsin, LaCrosse
3. Biodynamics Lab, University of Wisconsin, Madison
4. University of Wisconsin
5. University of Wisconsin, Oshkosh
6. Milwaukee Central YMCA
7. Professional Cardiac Rehabilitation Inc., Youngstown State U.
8. Cincinnati Reds Baseball Club
9. Beachwood High School, Beachwood, Ohio
10. Cardiovascular Rehabilation Institute, Kansas City, MO.
11. Henrickson Clinic, Popular Bluff, MO
12. F. W. Kilinke M.D., St. Louis, MO
13. Divine Redeemer Hospital, St. Paul, MN
14. Adult Fitness Program, Central Michigan U., Mt. Pleasant, Mich.
15. Physical Education Department, Andrews University, Berrin Springs, Mich.
16. V. A. Hospital, Ann Arbor, Michigan
17. Human Lab, Purdue
18. North Memorial Medical Center, Minneapolis MN
19. University of Dayton, Ohio

LIST OF ALL EMPLOYERS WHO WOULD HIRE HARPER'S GRADUATES IN CARDIAC EXERCISE TECHNICIAN PROGRAM

The Round Lake Area Park District
Northern Illinois Special Recreation Assoc.
The Buehler YMCA
Evanston YMCA
Exercise Lab. Children's Memorial Hospital
North Suburban YMCA
Center for Sports Medicine - Illinois Masonic Hospital
Leaning Tower YMCA
Center for Sports Medicine - Northwestern University Medical School
Park Ridge YMCA
Western DuPage Special Recreation Assoc.
Northern Suburban Special Recreation Assoc.
Special Recreation Assoc. of Oak Park
Luther High School North (possibly)
Executive Heart Line
Lake Region YMCA
St. Francis Hospital (possibly)
Fitness Analysis
Swedish Covenant Hospital
Rock Island Family YMCA
Rockford YMCA (possibly)
V.A. Hospital - Marion, Ill.
YMCA - Macomb, Ill. (possibly)
Case Western Reserve University - Cleveland, Ohio
Bellin Memorial Hospital - Green Bay, Wisc.
Youngstown State University - Youngstown, Ohio
Beachwood High School - Beachwood, Ohio
Cardiovascular Rehab. Institute - Kansas City, Mo.
University of Missouri - Columbia, Mo.
Henrickson Clinic - Poplar Bluff, Mo.
University of Missouri - St. Louis, Mo.
Divine Redeemer Hospital - South St. Paul, Minn.
Human Laboratory, Purdue Univ. - W. Lafayette, In.
North Memorial Medical Center - Minneapolis, Minn.

LIST OF ORGANIZATIONS AND PERSON WHO WOULD RECOMMEND THAT PRESENT EMPLOYEES ENROLL IN PROPOSED PROGRAM AT HARPER FOR CARDIAC EXERCISE TECHNICIANS

Rock Island Family Y. M. C. A.
V. A. Hospital; Marion, Indiana
Y. M. C. A. ; Macomb, Ill.
Y. M. C. A. ; Peoria, Ill.
Kimberly Clark Corp
University of Wisconsin; Eau Claire, Wisc.
Columbia Hospital; Milwaukee, Wisc.
University of Wisconsin; Milwaukee, Wisc.
University of Wisconsin; Madison, Wisc. (possibly)
Youngstown State University; Youngstown, Ohio
Beachwood High School; Beachwood, Ohio
Cardiovascular Rehab. Institute; Kansas City, Mo.
University of Mossouri; Columbia, Mo.
Henrickson Clinic; Poplar Bluff, Mo.
University of Minnesota; Minneapolis, Minn.
F. W. Klinge, M. D. ; St. Louis, Mo.
Divine Redeemer Hospital; South St. Paul, Minn.
Borgess Hospital; Kalamazoo, Mich.
Central Michigan University; Mt. Pleasant, Mich.
Andrews University; Berrien Springs, Mich.
Valparaiso University; Valparaiso, In.
Howard Community Hospital; Kokomo, In.
Lafayette Area Y. M. C. A.; Lafayette, In.
University of Dayton; Dayton, Ohio
The Round Lake Area Park District
Northern Illinois Special Recreation Association; Crystal Lake, Ill.
The Buehler Y. M. C. A. ; Palatine, Ill.
Evanston Y. M. C. A. ; Evanston, Ill.
North Suburban Y. M. C. A. ; Northbrook, Ill.
Leaning Tower Y. M. C. A. ; Niles, Ill.
Condell Memorial Hospital; Libertyville, Ill.
Western DuPage Special Recreation Association; Wheaton, Ill.
Northern Suburban Special Recreation Association; Highland Park, Ill.
Special Recreation Association; Oak Park, Ill
Ravenswood Y. M. C. A.; Chicago, Ill.
Executive Heart Line; Niles, Ill.
Lawson Y. M. C. A.
Lake Region Y. M. C. A.; Crystal Lake, Ill.
St. Francis Hospital; Blue Island, Ill.
Fitness Analysis; Chicago, Ill.
Northwest Special Recreation Association; Arlington Heights, Ill.
Swedish Covenant Hospital; Chicago, Ill.

Suggestions or Comments About Proposed Program
for Cardiac Exercise Technicians

Would appreciate information regarding certification in total program.

We would possibly be interested in placing students enrolled in the internship course in our facility, but becasue we are an educational program - faculty, students, etc., we would not be interested in hiring people as technicians.

People coming from our situation would already have one or two semesters of the Cardiac Leader curriculum.

More exercise physiology.

Pathophysiology - should be aware of all phases of cardiac rehabilitation.

As a specialist in cardiac exercise, testing, and prescription, I do not feel that this program is necessary. A physical therapist is much more qualified to perform this without education, train' , and experience. I feel that P. Wilson's program is designed for P.E.'s due to lack of teaching jobs. We don't need another person with such limited expertise. Their employability in a hospital is questionable and their function would be duplication of P.T. and Recreation Therapist.

Can't really answer this although it appears quite thorough - but impractical at this point in education - money not there as far as internship is concerned.

I consider the internship the most important for their two year experience.

Course in coronary heart disease focusing on risk factors and pathology. Necessary to interact with patients. Some exposure to cardiac drugs - effect on ECG, etc.

I would like to see students involved in patient education, ECG analysis, patient's progress analysis (including report writing).

Very good, especially ELT courses. I would like to see this person have course work in physical growth and motor development, sport phychology.

Emphasize a good course in basic nutrition. Six hours related to: food preparation, proper nutrition for excellent health. Caloric intake: caloric expenditure - balance, application of diet and exercise in their own lifestyle for community example.

Not enough courses in psychology. We are dealing with a psycho-physiological animal, not merely a physiological one. I would recommend a course in social-psychology and one physiological psychology.

In going over your curriculum, it looks as if your program is oriented toward research and testing. I would suggest possibly adding some clinical type courses in setting up programs of exercise. I would think that some course in actual programs of running, weight training, etc., are needed.

It seems to me that the job skills developed are very limited. Most YMCA's and other agencies would want someone who could work with testing and lead exercise.

Need opportunity to learn maintenance and repair of common lab equipment.

Curriculum appears excellent - however, should try to involve student in as much practical experience as possible.

You need some course work in basic human pathology.

I would stress physiology most heavily, and parts of course covering respiratory and circulatory most heavily. Medical technology course not needed.

I like it.

Additional work in leading adult exercise groups.

Very well done.

I assume courses 110, 160, 161 and 101 include both lectures and laboratories.

I would never choose this curriculum over that of an exercise leader. There is so little difference yet the exercise leader is the supervisory position. If anything this course work looks more demanding.

I do not feel a position such as this can be adequately prepared for a two year program.

I'd broaden H.P.I. 101 to include physical fitness components and condition for them.

I suggest some recreational courses be implemented into the curriculum. Many participants will be looking for recreational activities as their means for exercise.

Most YMCA's would not be able to have a technician and leader. Technician should have some teaching techniques to provide for leadership in mens, womens and senior citizens exericse classes.

Increased hours in psychology with particular reference to psychological problems involved with cardiacs. More hours in anatomy as pertaining to the heart along with increased hours in electrocardiograph.

Good program, emphasize practical experiences and human interaction. Larger background in handicapped areas.

More activity level courses.

Add introduction to statistics.

Exercise prescription writing for the "generally healty" person could be done by a well trained technician but should not be undertaken by anyone other than a physician with sufficient experience in this work.

The curriculum is excellent but I am not convinced that there will be enough jobs in exercise science and cardiac rehabilitation to place your graduates.

In both cardiac exercise and leader curriculums there should be more emphasis on practical application of graded exercise tresting, such as developing an individualized exercise prescription. Teaching participants how to monitor their own workouts, individual and group motivation techniques, various elements that go into a well rounded individual or group exercise workout.

In our laboratory, exercise technician should have understanding of statistical methods, operation of computer terminals, etc.

Curriculum needs courses in administration of program, P.R. per program, and marketing of CET. There needs to be courses in exercise prescription (type, intensity, duration, heart rates, etc). To test without post-test follow-up recapping exercise prescription is bad.

Background in Cardiac risk factors - general knowledge of heart disease. Advanced training is CPR - including use of equipment and drugs.

Some type of course on leadership skills and interpretation of exercise prescription to patients. Administrative skills in dealing with agencies in Medical and Health Education fields.

Both curricula are very impressive - appear well thought out, logically progressive and fairly complete. I would strongly urge the addition of social-psychology and growth-aging philosophy.

SURVEY OF NEED FOR CARDIAC EXERCISE

LEADER PROGRAM

Survey of Need for Cardiac Exercise Leader Program

Major function of a person completing proposed Cardiac Exercise Leader Program	Number and Percent Agreeing that this is a major function							
	Local Chicago Area		Regional Illinois Outside Chicago Area		Out-of-state		Total	
	N	%	N	%	N	%	N	%
Execute the exercise prescription under guidelines established with program director & physician	28	100	10	100	44	44/46	82	97.6
Work with the exercise technician in meeting exercise requirements	28	100	10	100	44	93.6	82	96.5
Interact and communicate with program director, physician subjects and patients	28	100	9	100	43	93.5	80	96.4
Educate the patient concerning exercise	28	100	9	100	42	91.3	79	95.2
Evaluate the patient's response to exercise	27	96.4	7	77.8	42	91.3	76	91.6
Interpret metabolic data from exercise tests	22	78.6	8	88.9	39	86.7	69	84.2

Additional duties which person must be able to perform

	Number
Educational presentations	3
Class leadership on gym floor	3
Promotion of programs	2
Instruct patient's family in CPR	2
Competency	1
Emergency CPR	1
Ability to communicate with and motivate people	1
Interpret research	1
Check guidelines as established by the American College of Sports Medicine	1
Emergency First Aid/Water Safety instructor	1
Ability to do one or two common fitness tests	1
Interpretation of EKG's	1
Conduct exercise tests	1
Counsel patient	1
Ability to write or modify exercise prescriptions	1
Develop forms for records	1
Plan family oriented exercise activity programs	1
Have wide knowledge of exercise methods and techniques	1
Proposed curriculum would not provide enough knowledge for areas of responsibility suggested	1

If Cardiac Exercise Leader program were implemented, the number of graduates various organizations would hire

Year	Local Chicago Area	Regional Illinois Outside Chicago Area	Out-of-state	Total
1982	24	2	6	32
1983	13	0	4.5	17.5
1984	10	0	3.5	13.5

Annual Salary Range
Cardiac Exercise Leader Graduates Could Expect

	Local Chicago area	Regional in Illinois Outside Chicago area	Out-of-state	Total
	$ 6,000-$ 7,500	$ 6,000-$ 8,000	$ 6,240-$10,400	
	6,240- 10,400	9,000- 11,000	7,000- 10,000	
	7,600- 9,600	12,000- 12,000	7,200- 7,500	
	8,000- 10,000		7,280- 7,280	
	8,000- 10,000		8,000- 9,000	
	8,000- 12,000		8,500- 12,000	
	8,320- 8,320		8,800- 8,800	
	8,500- 9,000		9,000- 11,000	
	8,500- 9,500		9,000- 11,000	
	9,000- 11,000		9,000- 11,000	
	9,000- 11,000		10,000- 12,000	
	9,000- 11,000		10,000- 12,000	
	9,000- 12,000		10,000- 12,000	
	9,140- 9,140		10,000- 12,000	
	10,000- 12,000		10,000- 12,000	
	10,000- 13,000		10,000- 13,000	
	10,800 16,000		15,000- 18,000	
	11,000- 14,000		16,640- 20,800	
	13,520 16,640			
Average	$8,927-$11,163	$ 9,000-$10,333	$ 9,537-$11,654	$9,207- $11,322
Median	$9,000-$11,000	$ 9,000-$11,000	$ 9,000-$11,500	$9,000- $11,500

Organizations Who Now Have Employees
Working in the Role of Cardiac Exercise Leader

	Local Chicago Area	Regional Illinois Outside Chicago Area	Out-of State	Total
Number of organizations	15	3	25	43
Percent of organizations in sample	53.6	30	53.2	50.6
Number of organizations who have employees in this role with the following background				
Ph.D.	0	1	11	12
M.D.	1	0	0	1
Ed.D.	0	0	1	1
M.S.	4	1	7	12
M.A.	0	0	4	4
Degree plus additional training	2	0	0	2
M.Ed.	0	0	2	2
M.P.M.	0	0	1	1
B.S.	6	2	4	12
Exercise physiologist	0	0	1	1
Degree not specified	3	2	1	6
R.N.	0	0	1	1
Certificate not specified	1	0	2	3
ASCM	0	1	4	5
YMCA advanced specialist CET	1	1	1	3
Advanced physical fitness specialist	2	1	1	4
Sports medicine specialist	1	0	0	1
YMCA exercise leader	1	0	0	1
CPR	0	0	2	2
Student Aids	0	0	1	1
Special training	1	1	0	2
High school graduate	0	0	1	1

Number of Existing Employees Who Would be
Encouraged to Enroll in the Cardiac Exercise Leader Program

Type of enrollment	Local Chicago Area	Regional in Illinois outside Chicago Area	Out-of-state	Total
Only take courses for professional growth	35.5	2	22	59.5
Certificate in program	13.5	0	17.5	31
Degree in program	5	0	3.5	8.5

Number of Organizations Who Would Be
Interested in Providing Internships for Students

Degree of interest	Local Chicago Area	Regional in Illinois outside Chicago area	Out-of-state	Total
Definite	16	3	17	36
Possible or conditional	2	1	6	9

LOCAL INTEREST IN PROVIDING INTERNSHIPS FOR CARDIAC EXERCISE LEADER PROGRAM

Possibly interested or interested in providing internship under some conditions:

Special Recreation Assoc. of Oak Park
Indian Boundary Y. M. C. A.

Definitely interested:

The Round Lake Area Park District
Nothern Illinois Special Recreation Assoc.
The Buehler Y. M. C. A.
Evanston Y. M. C. A.
Exercise Lab.-Children's Memorial Hospital
North Suburban Y. M. C. A.
Leaning Tower Y. M. C. A.
Condell Memorial Hospital
Park Ridge Y. M. C. A.
Western DuPage Special Recreation Assoc.
Northern Suburban Special Recreation Assoc.
Lawson Y. M. C. A.
St. Francis Hospital
Fitness Analysis
Northwest Special Recreation Assoc.
Swedish Covenant Hospital

REGIONAL INTEREST IN PROVIDING INTERNSHIPS FOR CARDIAC EXERCISE LEADER PROGRAM

POSSIBLY INTERESTED OR INTERESTED IN PROVIDING INTERNSHIPS UNDER SOME CONDITIONS

Illinois State University - Normal, Ill.

DEFINITELY INTERESTED

Rock Island Family YMCA
Public Hospital - Kewanee, Ill.
Rockford YMCA

OUT OF STATE INTERESTED IN PROVIDING INTERNSHIPS FOR CARDIAC EXERCISE LEADER PROGRAM

POSSIBLY INTERESTED OR INTERESTED IN PROVIDING INTERNSHIP UNDER SOME CONDITIONS

Kimberly Clark Corp.
Case Western Reserve University - Cleveland, Ohio
Bellin Memorial Hospital - Green Bay, Wisc.
University of Missouri - St. Louis, Mo.
Oak Park High School - Oak Park, Mich.
St. Cloud State University - St. Cloud, Minn.

DEFINITELY INTERESTED

V.A. Hospital - Wood, Wisc.
Columbia Hospital - Milwaukee, Wisc.
University of Wisconsin - LaCrosse, Wisc.
University of Wisconsin - Milwaukee, Wisc.
University of Wisconsin - Oshkosh, Wisc.
Milwaukee Central YMCA
Youngstown State University - Youngstown, Ohio
Beachwood High School - Beachwood, Ohio
Cardiovascular Rehab. Institute - Kansas City, Mo.
Dr. F.M. Klinge - St. Louis, Mo.
Divine Redeemer Hospital - South St. Paul, Minn.
Central Michigan University - Mt. Pleasant, Mich.
Andrews University - Berrien Springs, Mich.
V.A. Hospital - Ann Arbor, Mich.
Human Laboratory , Purdue University - W. Lafayette, In.
North Memorial Medical Center - Minneapolis, Minn.
University of Dayton - Dayton, Ohio

LIST OF ORGANIZATIONS AND PERSONS WHO WOULD RECOMMEND THAT PRESENT EMPLOYEES ENROLL IN PROPOSED PROGRAM AT HARPER FOR CARDIAC EXERCISE LEADERS

Rock Island Family YMCA
The Round Lake Area Park District
Morthern Ill. Special Recreation Assn. - Crystal Lake
The Buehler YMCA - Palatine, Ill.
Evanston YMCA - Evanston, Ill.
Northern Suburban YMCA - Northbrook, Ill.
Leaning Tower YMCA - Niles, Ill.
Condell Memorial Hospital - Libertyville, Ill.
Park Ridge YMCA - Park Ridge, Ill.
Western DuPage Special Recreation Assn. - Wheaton, Ill.
Northern Suburban Special Recreation Assn. - Highland Park, Ill.
Special Recreation Assn. - Oak Park, Ill.
Ravenswood YMCA - Chicago, Ill.
Executive Heart Line - Niles, Ill.
Lawson YMCA
St. Francis Hospital - Blue Island, Ill.
Fitness Analysis - Chicago, Ill.
Northwest Special Recreation Assn. - Arlington Hts., Ill.
Swedish Covenant Hospital - Chicago, Ill.
Kimberly Clark Corp.
University of Wisconsin - Eau Claire, Wisc.
Columbia Hospital - Milwaukee, Wisc.
University of Wisconsin - Milwaukee, Wisc.
Youngstown State University - Youngstown, Ohio
University of Cincinnati - Cincinnati, Ohio
Beachwood High School - Beachwood, Ohio
Cardiovascular Rehab. Institute - Kansas City, Mo.
University of Missouri - Columbia, Mo.
Divine Redeemer Hospital - South St. Paul, Minn.
S.W. Michigan Cardiac Rehab. Center - Kalamazoo, Mich.
Central Michigan University - Mt. Pleasant, Mich.
Andrews University - Berrien Springs, Mich.
Howard Community Hospital - Kokomo, In.
Lafayette Area YMCA - Lafayette, In.
University of Dayton - Dayton, Ohio

LIST OF EMPLOYERS WHO WOULD HIRE HARPER'S GRADUATES IN CARDIAC EXERCISE LEADER PROGRAM

Rock Island Family Y. M. C. A.
V. A. Hospital; Marion, Illinois
Case Western Reserve University; Cleveland, Ohio
Youngstown State University; Youngstown, Ohio
Beachwood High School; Beachwood, Ohio
Cardiovascular Rehab. Institute; Kansas City, Mo.
Divine Redeemer Hospital; South St. Paul, Minn.
Andrews University; Berrien Springs, Mich.
Purdue University; West Lafayette, Indiana
North Memorial Medical Center; Minneapolis, Minn.
The Round Lake Area Park District
Northern Illinois Special Recreation Assoc.
The Buehler Y. M. C. A.
Evanston Y. M. C. A.
North Suburban Y. M. C. A.
Leaning Tower Y. M. C. A. (possibly)
Western DuPage Special Recreation Association
Northern Suburban Special Recreation Association
Special Recreation Association of Oak Park
Ravenswood Y. M. C. A.
Executive Heart Line
St. Francis Hospital (possibly)
Fitness Analysis
Northwest Special Recreation Association
Swedish Covenant Hospital

Suggestions or Comments About Proposed Program for Cardiac Exercise Leader

More exercise physiology.

Pathophysiology

Your program looks very good - YMCA, community centers, health clubs and clinics need people with this background.

I'm sorry I can't be of much help in this project, however, it sounds very worthwhile and I will be interested in your progress.

Field experience for these people is most valuable.

Some inclusions as far as exercise technician.

I would like to see students involved in patient education, ECG analysis, patient's progress analysis and counseling technique.

Additional psychology courses dealing with social psychology or human relations - possibly transactional analysis.

Be certain to have a course entitled "Exercise Prescription". The couse should have a section called "motivation".

Sorry, we at present have nothing in the future for this type of program.

I feel this would be an excellent program, however, I am not in the type of organization that would be using such an individual in the near future.

Believe you're short on requirement for "in the gym" exercise supervision experiences.

We do not anticipate needing additional personnel as we do not have the volume of exercise testing. Do you feel the degree program necessary? What about a crash course beyond a regular biological science degeee? Such as Wilson's program this summer at LaCrosse? Perhaps this could be an extension of a physical education program.

At present we do not have an exercise testing facility so I could not anticipate any positions opening in this department.

The Milwaukee Central YMCA is presently working with the Wisconsin Heart Association in developing a six month pilot project - Cardiac Exercise Therapy program. The program will begin by September 1. We have been conducting a successful program for business and industrial groups in Milwaukee involving fitness testing and an eight week starter fitness class. We hope to be engaged in EKG stress testing within the next year as a part of this program. As these programs unfold there will no doubt be a need for trained leaders and technicians here.

I like it.

Research design/statistics background so individual can read responses.

More work in physical education activities.

Very well done.

A course in environmental physiology or environmental medicine would be needed to cover better affects of temperature, attitude, carbon monoxide, and other pollutants.

I believe your course work distinguishes very little between an exercise technician and exercise leader. I do not believe that one course in exercise physiology is sufficient to perform adequately in the educational and supervisory capacity of an exercise leader. This needs to be at least a three year program.

Looks excellent

Both look good.

Wider based knowledge in anatomy as well as interpretation of electrocardiographs.

Does HSC 110 provide CPR rescuer card? Deal with legal implications of "testing". They would need four year degree to enter professional ranks. We probably would not be able to place two year degree students.

At least in a clinical setting there is a need for a more versatile "cardiac technician", one that can handle exercise testing, Holter monitoring, pacemaker evaluation, and perhaps electrocardiography.

More activity level courses.

Introduction to statistics.

Promotion. Record maintenance.

There is a lack of course work in physical education, i.e., principles, methods, and administration, as well as history and philosophy of education.

For PED 204 I feel there should be more theory and types of activities adults and retirement age can and should do to be physically fit - cardiovascular type activities.

This type of individual should have some training in the theory and practice of physical conditioning covering the various types of conditioning programs.

A terrific idea (just figure out how to help YMCA's and your students gain credibility with the medical profession.)

APPENDIX

William Rainey Harper College
Algonquin and Roselle Roads
Palatine, Illinois 60067
312-397-3000

February 25, 1977

Dear Colleague:

William Rainey Harper College has developed educational programs to train persons to be Cardiac Exercise Technicians and Cardiac Exercise Leaders. These programs leading to a two-year Associate of Applied Science Degree would be available to both full-time and part-time students who desire to work in these areas.

The two proposed programs are designed to be an integral part of the Harper Physical Fitness Center where the Human Performance Laboratory will be located. Students will have an opportunity to learn in a laboratory where graded exercise testing, a graded exercise program and a cardiac rehabilitation program will be carried out under the director of laboratory and medical supervision. Dr. Philip K. Wilson, Professor/Director, Human Performance Laboratory, LaCrosse Cardiac Rehabilitation Program, the University of Wisconsin - LaCrosse, LaCrosse, Wisconsin, has been involved in the design and development of these programs according to the guidelines of the American College of Sports Medicine.

Enclosed are copies of the proposed Exercise Technician and Exercise Leader programs for your examination. We think that persons graduating with this expertise will be able to function effectively as Exercise Technicians or Exercise Leaders. This program will also provide qualified persons to work in Human Performance Laboratories.

We are asking for your help in gathering information regarding manpower needs for persons with these qualifications. Would you please complete the enclosed survey and return it in the self-addressed, stamped envelope by March 15, 1977. Please remember that the first persons will complete the program Spring 1982 as you plan for your future staff needs.

Thank you for your assistance with this project. Our educational endeavors are dependent on interested persons assisting us in our service to the community.

Sincerely,

John R. Birkholz

John R. Birkholz
Vice President, Academic Affairs

JRB:jk

Enc.

SURVEY OF NEED FOR EDUCATIONAL PROGRAMS
IN CARDIAC EXERCISE TECHNICIAN AND
CARDIAC EXERCISE LEADER

Facility_____ Phone_____

Location_____

Name of Person Completing Questionnaire_____

Position_____

Phone_____

Type of facility and services offered. Check those that apply.

_____ Exercise Center
_____ Physical Fitness Club
_____ YMCA
_____ Clinical - hospital, private clinic, etc.
_____ Sports Medicine
_____ Athletic Associations
_____ Community organization
_____ Stress testing for evaluation
_____ Exercise prescription
_____ Exercise program
_____ Other - Please Describe

_____

_____

Do you agree that these should be the major functions of a person completing the proposed Cardiac Exercise Technician program by certificate or the two-year Associate Applied Science degree?

YES	NO	
____	____	1. Prepare a graded exercise station for administration of tests.
____	____	2. Screen patients for graded exercise testing.
____	____	3. Administer graded exercise test.
____	____	4. Calculate data obtained during graded exercise.
____	____	5. Implement emergency procedures.
____	____	6. Interact and communicate with the program director, physician, exercise leader, subjects and patients.

What additional duties should this person be able to perform?

If this program were implemented Fall 1980, how many graduates would your facility employ following their graduation?

____1982 ____1983 ____1984

At what range of annual salary could this person expect as a new employee?

$_____ to $_____

Are there any present employees involved in this type of work?

____Yes
____No

If yes, please describe person's background.

Degree_____
Certificate_____
Other_____

How many existing employees would you encourage to enroll in the program?

Numbers	Type of Program
_____	Courses for professional growth
_____	Certificate in program
_____	Degree in program

A proposed curriculum is attached for your information.

Please list any suggestions or comments you have regarding the proposed curriculum.

Would you be interested in placing students enrolled in the internship course in your facility? ____Yes ____No

Do you agree that these should be the major functions of a person completing the proposed Cardiac Exercise Leader Program by certificate or a two-year Associate of Applied Science degree?

YES NO

___ ___ 1. Interpret metabolic data from exercise tests.

___ ___ 2. Work with the exercise technician in meeting exercise requirements.

___ ___ 3. Execute the exercise prescription under guidelines established with program director and physician.

___ ___ 4. Educate the patient concerning exercise.

___ ___ 5. Evaluate patient's response to exercise.

___ ___ 6. Interact and communicate with program director, physician, subjects and patients.

What additional duties should this person be able to perform?

If this program were implemented Fall 1980, how many graduates would your facility employ following their graduation?

____1982 ____1983 ____1984

At what range of annual salary could this person expect as a new employee?

$_____ to $_____

Are there any present employees involved in this type of work?

____Yes
____No

If yes, please describe person's background.

Degree_____
Certificate_____
Other_____

How many existing employees would you encourage to enroll in the program?

Numbers	Type of Program
_____	Courses for professional growth
_____	Certificate in program
_____	Degree in program

A proposed curriculum is attached for your information.

Please list any suggestions or comments you have regarding the proposed curriculum.

Would you be interested in placing students enrolled in the internship course in your facility? ____Yes ____No

Who has responsibility for hiring staff members at your facility?

Name_____

Phone_____

Please return the questionnaire by March 15, 1977, in the enclosed envelope. Your assistance in completing it is most appreciated.

SAMPLE CURRICULUM
CARDIAC EXERCISE TECHNICIAN

1st Semester			Credit Hours
ENG	101	Composition	3
SOC	101	Introduction to Sociology	3
BIO	110	Principles of Biology	4
BIO	160	Human Anatomy	4
PED	201	First Aid	2
			16

2nd Semester			
ENG	103	Report Writing	3
PSY	101	Introduction to Psychology	3
BIO	161	Human Physiology	4
MLT	101	Medical Technology	3
HPI	103	Equipment and Instrumentation	3
			16

3rd Semester			
HPI	101	Exercise Physiology	3
HPI	104	Electrocardiography	3
HSC	110	Emergency Medical Technician Training	5
ELT	101	Circuits I, Resistive Circuit Analysis	4
			15

4th Semester			
HPI	102	Graded Exercise Testing	3
HPI	105	Internship in Cardiac Exercise Technician	5
PHI	180	Medical Ethics	3
ELT	102	Circuits II, Single Time Constant Circuits	4
			15
	Total Hours		62

SAMPLE CURRICULUM
CARDIAC EXERCISE LEADER

1st Semester			Credit Hours
ENG	101	Composition	3
SOC	101	Introduction to Sociology	3
BIO	110	Principles of Biology	4
BIO	160	Human Anatomy	4
DIT	101	Basic Nutrition	3
			17

2nd Semester			
ENG	103	Report Writing	3
PSY	101	Introduction to Psychology	3
BIO	161	Human Physiology	4
PED	201	First Aid	2
DIT	201	Nutrition	3
			15

3rd Semester			
HPI	101	Exercise Physiology	3
HPI	104	Electrocardiography	3
HSC	110	Emergency Medical Technician Training	5
PED	100	Diet and Exercise for the Adult	1
MLT	101	Medical Technology	3
			15

4th Semester			
HPI	102	Graded Exercise Testing	3
HPI	105	Internship in Cardiac Exercise Leader	5
PHI	180	Medical Ethics	3
PED	204	Methods of Teaching Physical Education Activities	2
			13
	Total Hours		60

CARDIAC EXERCISE TECHNICIAN
COURSE DESCRIPTIONS

BIO 110 Principles of Biology 4 credits

Emphasis is placed upon cell structure and function by exploring the various patterns that have evolved within cells for carrying out important life functions. This includes cell ultrastructure, cell surface-volume relationships, cellular metabolism and energetics, mitosis and meiosis, genetics, DNA, RNA and protein synthesis, gene action, population genetics, development and environment.

BIO 160 Human Anatomy 4 credits

Anatomy of the human body with the following systems being studied in order given: skeletal, muscular, nervous, circulatory, integumentary, digestive, urinary, respiratory, and reproductive. Basic biochemistry, fluid balance, cellular ultra-structure, and histology are also included. In this course, special application will be made to meet the needs of students in health careers, biology, and physical education.

PIO 161 Human Physiology 4 credits

Physiological principles at the molecular, cellular, tissue, organ, and system level, as they pertain to the human organism. The following systems are studied in detail: skeletal, muscular, circulatory, nervous, digestive, respiratory, urinary, reproductive, and endocrine. In this course, special applications will be made to meet the needs of students in health careers, biology, and physical education.

ELT 101 Circuits I, Resistive Circuit Analysis 4 credits

Resistive circuits with time-varying source voltage. Physics of of electricity, plus units, definitions, symbols, and notations for electrical quantities. Circuit properties and their applications to significant circuit configurations.

ELT 102 Circuits II, Single Time Constant Circuits 4 credits

R-C and R-L single time constant circuits. Basic switching, circuitry, circuits with square-wave and step voltages as sources, and sinusoidal voltages as sources.

ENG 101 Composition 3 credits

A course in college composition emphasizing the organization and development of expository prose. Introduction to the critical reading of selected essays.

ENG 103 Report Writing 3 credits

Fundamentals of semantics, syntax, and rhetoric as applied to business, industrial, and governmental report writing.

HSC 110 Emergency Medical Technician Training 5 credits

This course, designed to train emergency medical technicians, covers all emergency care procedures short of those rendered by physicians or by allied medical personnel under direct supervision of a physician. The course emphasizes the development of student skills in recognition of symptoms of illnesses and injuries and proper procedures of emergency care. Reliance is heavily placed on demonstration and practice as a teaching method.

HPI 101 Exercise Physiology 3 credits

Implications of exercise to the circulatory and respiratory systems are studied in relation to cardiovascular physiology as well as the functioning of these two systems during a time of rest. Effects of abnormalities in the structure and functioning of the cardiovascular systems are included for involvement of the individual in an endurance oriented exercise program.

HPI 102 Graded Exercise Testing 3 credits

A study of methods, procedures, and techniques of diagnostic and functional graded exercise testing. Aptitude and knowledge regarding referral procedures, data interpretation, contraindications, protocol, equipment and follow-up procedure regarding graded exercise testing will be studied.

HPI 103 Equipment and Instrumentation 3 credits

Operational methods and techniques associated with equipment utilized in the Human Performance Laboratory are studied as well as a basic understanding of available pertinent equipment and its capabilities. Specified laboratory exercises are conducted.

HPI 104 Electrocardiography 3 credits

Instruction in the basics of the normal, the abnormal resting, and the exercise electrocardiogram including lecture experiences and intensive investigation of documental electrocardiogram-graded exercise testing case studies.

HPI 105 Internship 5 credits

Provides work experiences in Cardiac Exercise agency, industrial or institutional environment. Administrative, testing, laboratory procedure, and exercise sessions of the site are understood and demonstrated.

MLT 101 Medical Technology 3 credits

An introduction to the scope of hospital laboratory procedures. Instruments, such as the binocular microscope, analytical balance, and refractometer, are used in the study of blood and urine. Lectures and laboratory stress proper use of instruments in basic techniques.

PED 201 First Aid 2 credits

Regulation American Red Cross instruction in first aid; immediate care given to a person who has been injured or has been suddenly taken ill. Includes self-help and home care if medical assistance is not available or is delayed. The Standard Red Cross Card is issued to those students who qualify.

PHI 180 Medical Ethics 3 credits

Designed to consider ethical issues related to the health science professions such as professional ethics, science and the person, euthanasia, abortion, human experimentation, the criteria for death, and the rights of patients.

PSY 101 Introduction to Psychology 3 credits

Human behavior with reference to perception, learning, individual differences, intelligence, and personality. Developmental method stressed rather than experimental. Reference made to daily life and everyday problems.

SOC 101 Introduction to Sociology 3 credits

Introductory analysis and description of the structure and dynamics of human society. Application of scientific methods to the observation and analysis of social norms, groups, intergroup relations, social change, social stratification, and institutions.

BIO 110 Principles of Biology 4 credits

Emphasis is placed upon cell structure and function by exploring the various patterns that have evolved within cells for carrying out important life functions. This includes cell ultrastructure, cell surface-volume relationships, cellular metabolism and energetics, mitosis and meiosis, genetics, DNA, RNA and protein syntheses, gene action, population genetics, development and environment.

BIO 160 Human Anatomy 4 credits

Anatomy of the human body with the following systems being studied in order given: skeletal, muscular, nervous, circulatory, integumentary, digestive, urinary, respiratory, and reproductive. Basic biochemistry, fulid balance, cellular ultra-structure, and histology are also included. In this course, special application will be made to meet the needs of students in health careers, biology, and physical education.

BIO 161 Human Physiology 4 credits

Physiological principles at the molecular, cellular, tissue, organ, and system level, as they pertain to the human organism. The following systems are studied in detail: skeletal, muscular, circulatory, nervous, digestive, respiratory, urinary, reproductive, and endocrine. In this course, special applications will be made to meet the needs of students in health careers, biology, and physical education.

DIT 101 Basic Nutrition 3 credits

Introduces the principles of human nutrition and their application to the needs of normal individuals of all age groups.

DIT 102 Advanced Nutrition 3 credits

Studies the nutritional care of a patient through the prescription of modified diets. Emphasis on techniques of diet counseling.

ENG 101 Composition 3 credits

A course in college composition emphasizing the organization and development of expository prose. Introduction to the critical reading of selected essays.

ENG 103 Report Writing 3 credits

Fundamentals of semantics, syntax, and rhetoric as applied to business, industrial, and governmental report writing.

HPI 101 Exercise Physiology 3 credits

Implications of exercise to the circulatory and respiratory systems are studied in relation to cardiovascular physiology as well as the functioning of these two systems during a time of rest. Effects of abnormalities in the structure and functioning of the cardiovascular systems are included for involvement of the individual in an endurance oriented exercise program.

HPI 102 Graded Exercise Testing 3 credits

A study of methods, procedures, and techniques of diagnostic and functional graded exercise testing. Aptitude and knowledge regarding referral procedures, data interpretation, contraindications, protocol, equipment and follow-up procedure regarding graded exercise testing will be studied.

HIP 104 Electrocardiography 3 credits

Instruction in the basics of the normal, the abnormal resting, and the exercise electrocardiogram including lecture experiences and intensive investigation of documental electrocardiogram-graded exercise testing case studies.

HPI 105 Internship 5 credits

Provides work experiences in Cardiac Exercise Leader in a clinical, agency, industrial or institutional environment. Administrative, testing, laboratory procedure, and exercise sessions of the site are understood and demonstrated.

HSC 110 Emergency Medical Technician Training 5 credits

This course, designed to train emergency medical technicians, covers all emergency care procedures short of those rendered by physicians or by allied medical personnel under direct supervision of a physician. The course emphasizes the development of student skills in recognition of symptoms of illnesses and injuries and proper procedures of emergency care. Reliance is heavily placed on demonstration and practice as a teaching method.

MLT 101 Medical Technology 3 credits

An introduction to the scope of hospital laboratory procedures. Instruments, such as the binocular microscope, analytical balance, and refractometer, are used in the study of blood and urine. Lectures and laboratory stress proper use of instruments in basic techniques.

PED 100 Diet and Exercise for the Adult 1 credit

Increases self-awareness about diet and exercise through the application of the various self-concepts such as physical fitness, skill learning, weight control, body mechanics and physiology of exercise. May be repeated up to a maximum of 2 credit hours.

PED 201 First Aid 2 credits

Regulation American Red Cross instruction in first aid; immediate care given to a person who has been injured or has been suddenly taken ill. Includes self-help and home care if medical assistance is not available or is delayed. The Standard Red Cross Card is issued to those students who qualify.

Cardiac Exercise Leader

PED 204 Methods of Teaching Physical Education Activities 2 credits

Methods used in teaching individual and team sports, with opportunity for practical application. Analysis of technique, planning of drills, and planning units for tennis, softball, swimming, weight training, and volleyball, with emphasis on teaching methods for elementary and secondary schools.

PHI 180 Medical Ethics 3 credits

Designed to consider ethical issues related to the health science professions such as professional ethics, science and the person, euthanasia, abortion, human experimentation, the criteria for death, and the rights of patients.

PSY 101 Introduction to Psychology 3 credits

Human behavior with reference to perception, learning, individual differences, intelligence, and personality. Developmental method stressed rather than experimental. Reference made to daily life and everyday problems.

SOC 101 Introduction to Sociology 3 credits

Introductory analysis and description of the structure and dynamics of human society. Application of scientific methods to the observation and analysis of social norms, groups, intergroup relations, social change, social stratification, and institutions.

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